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CHRONOLOGY OF THE MOSKVA GUIDED MISSILE RESEARCH AND DEVELOPMENT PLANT KHIMKI 301 USSR

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CHRONOLOGY OF THE MOSKVA GUIDED MISSILE RESEARCH AND DEVELOPMENT PLANT KHIMKI 301, USSR

SUMMARY/CONCLUSIONS

This report is primarily concerned with the chronological development of the Moskva Guided Missile Research and Development Plant Khimki 301. A critical appraisal of all photography covering the plant has resulted in interpretations of functions of most structures. The extensive modification of facilities first reported as operational in the early 1950's suggests that the plant is, and has been, engaged in follow-on missile programs which may or may not be related to the surface-to-air and air-to-surface missiles for which it was apparently originally designed. The data presented in this report are pertinent to the understanding of the entire Khimki Complex and are essential in establishing the relationship of research, development, testing, and production facilities to the overall Soviet missile program.

INTRODUCTION

The Moskva Guided Missile Research and Development Plant Khimki 301 is located at 55-54N 037-25E on the northwest outskirts of Moskva (Figure 1). Plant 301 consists of a Plant Area and Test Area, both of which will be discussed in this report (Figure 2). The Plant and Test Areas are separated by the Plant and Test Areas of the Moskva Missile and Space Propulsion Development Center Khimki 456; the Test Area of Plant 301 is adjacent to the Test Area of Plant 456 (see Figure 2). Another facility associated with Plant 301 is the Moskva Experimental Plant Khimki 293 located at 55-54N 037-27E adjacent to and east-southeast of Plant 456. Plant 293 consists of both a Plant Area and a Test Area.

The 301 Plant Area was first observed in September 1944 (Figure 3). The plant may have previously supported Aircraft Plant 84, which was evacuated to Tashkent in 1941. 1/ A majority of the buildings present in 1944 have been either refurbished or completely rebuilt. Plant 301 was one of the initial centers exploiting captured German technology and personnel, as was Khimki Plant 456.

German scientists reported that the V-301 surface-to-air missile (SA-1) and an air-to-surface missile were developed and produced in limited quantities by 1951-52. 2/ The first missiles from this plant for aerodynamic, stabilization, and control tests were available in early 1951. 3/

PLANT 301 TEST AREA

Figure 4 shows the Test Area in September 1967, and Figure 5 is a layout drawing of the Test Area in which structures are color coded to show their construction chronology. Table 1 summarizes the available data from the 25 photographic missions that have covered the Test Area in the time period starting in June 1962 and ending in September 1967; item numbers in this table are keyed to Figure 5. The photographic coverage, although relatively frequent, was often of poor interpretability, particularly during the period from July 1961 to June 1964; as a result some items are reported as first observed and complete on the same date. On the coverages of poorer interpretability, it is not possible to determine with certainty whether or not a structure is operational--or even complete. The highlights of construction chronology given in the following paragraphs will deal only with Khimki Plant 301 Test Area.

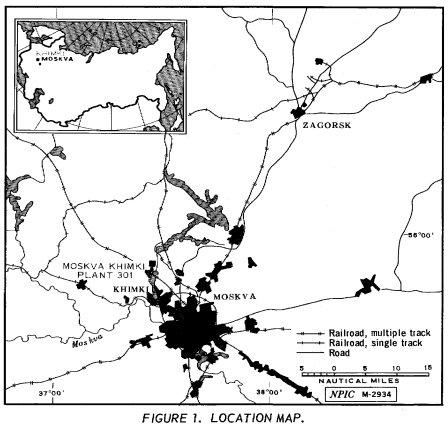

FIGURE 1. LOCATION MAP.

HIGHLIGHTS OF CONSTRUCTION CHRONOLOGY OF PLANT 301 TEST AREA

15 September 1944 - 1961

The Test Area was not present on September 1944 photography of the site (see Figure 3). It was first observed on KEYHOLE photography of July 1961. Although the Test Area in general could be identified at that time, it was not possible to describe the construction status of the various buildings.

1962

The first interpretable KEYHOLE photography was obtained in June 1962. Significant items first observed in June 1962 included Test Stand 1 (item 21, Figure 5) and 8 other structures with a total roof cover of 25X1 No apparent signs of test activity were observed at Test Stand 1 during this time period. 25X1

1963

Numerous completed maintenance and test support structures were observed by September 1963. These structures increased the roof cover by 20,425 square feet. Once again no apparent signs of recent test activity were observed at Test Stand 1.

1964

The first photographic coverage of fair interpretability was obtained in June 1964. This time period was one of rapid expansion of Khimki Plant 301. The roof cover of the Test Area was increased practically doubling the roof cover present in September 1963. 25X1

25X1

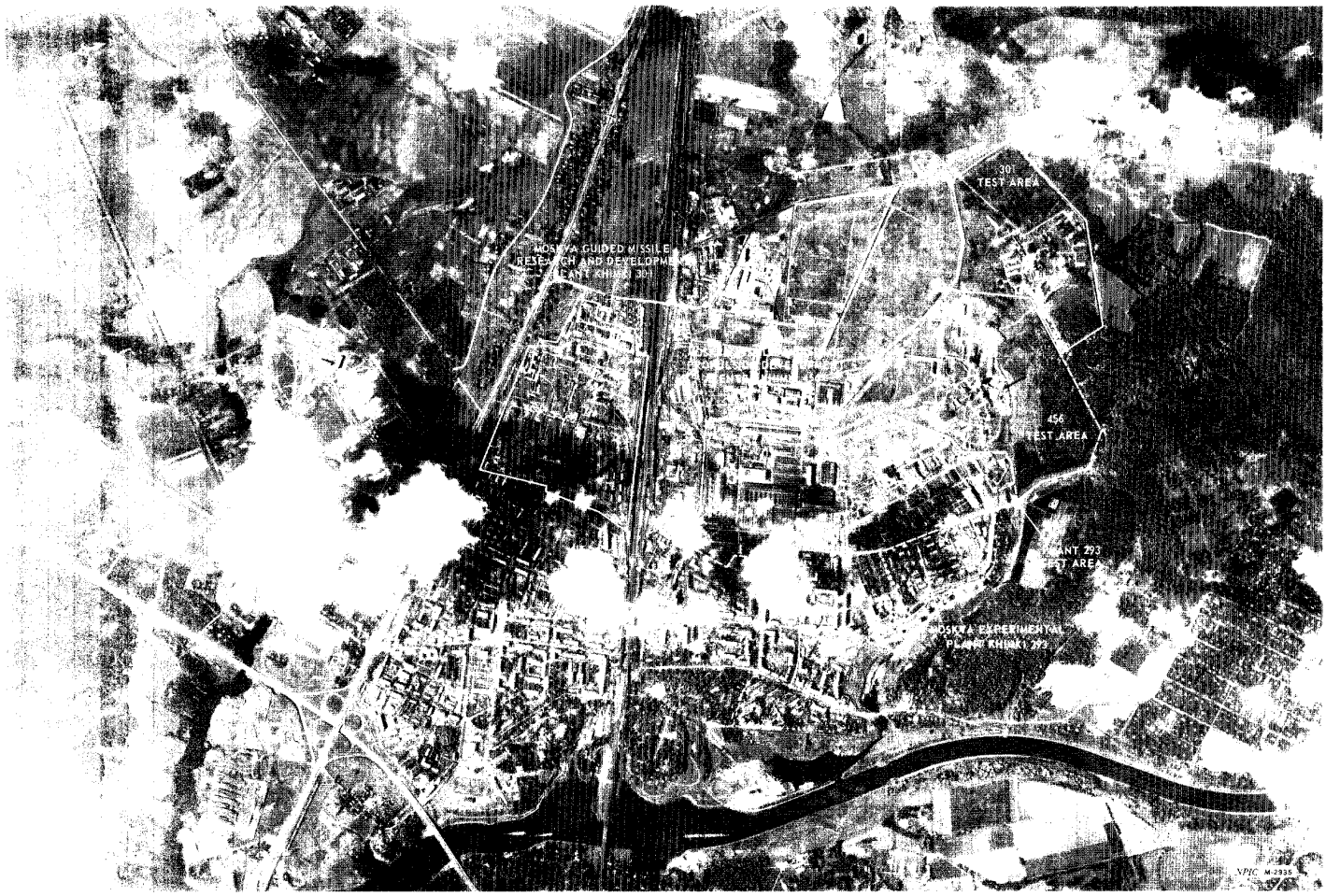

FIGURE 2. MOSKVA GUIDED MISSILE RESEARCH AND DEVELOPMENT PLANT [illegible] USSR.

25X1

FIGURE 3 - PART 1 - SEPTEMBER 1942.

25X1

TOP SECRET [illegible] RUFF

25X1

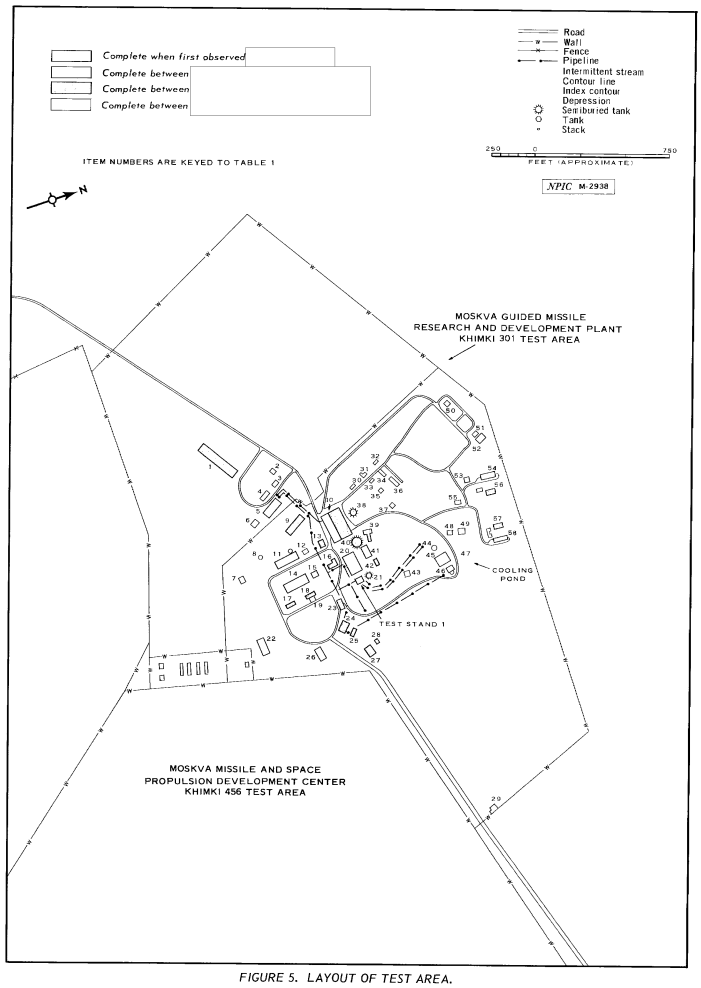

FIGURE 5. LAYOUT OF TEST AREA.

Table 1. Test Area of Plant 301
(Item numbers are keyed to Figure 5)

Item No	Function/ Description	Date First Observed**	Date Observed Complete	Explanatory Notes
1	Storage bldg	Sep 63	Jun 64	
2	Support bldg	Jun 64	Jul 66	
3	Support bldg	Jun 64	Jul 66	
4	Support bldg	Jun 64	Jul 66	
5	Checkout/support bldg	Jun 62	--	Connected by 5-ft-diam pipeline to main checkout/asbly bldg (item 10)
6	Support bldg	Jun 64	Jul 66	
7	Support bldg	Jun 64	Jul 66	
8	Tank	Jun 64	Jul 66	Aprx capacity, 54,000 gal
9	Checkout/support bldg	Sep 63	Jun 64	
10	Checkout/asbly bldg	Jun 62	Jun 64	
11	Steamplant	Jun 62	--	
12	Service bldg	Jun 64	Jul 66	
13	Service bldg	Sep 63	Jun 64	
14	Checkout/support bldg	Jun 62	--	
15	Service bldg	Jun 62	--	
16	Lab/engineering bldg	Sep 63	Jun 64	Width dimension overall
17	Service bldg	Sep 63	Jun 64	
18	Prob pumphouse	Sep 63	Jun 64	
19	Vertical pressure tanks	Jul 66	--	84 vertical pressure bottles, poss containing gaseous nitrogen or helium
20	Main test support bldg	Jun 62	--	
21	Test Stand 1	Jun 62	--	Height aprx from top of superstructure to bottom of blast deflector
22	Service bldg	Sep 63	--	
23	Service bldg	Sep 63	Jun 64	
24	Test support bldg	Sep 63	Jun 64	
25	Test support bldg	Jun 64	--	Width dimension overall, roof cover aprx
26	Service bldg	Sep 63	--	
27	Service bldg	Jun 64	--	
28	Service bldg	Jun 64	--	
29	Guardhouse	Jul 66	--	Prob present earlier
30	Maint bldg	Sep 63	--	Width dimension overall
31	Maint bldg	Sep 63	--	
32	Maint bldg	Sep 63	--	Width dimension overall
33	Maint bldg	Sep 63	--	
34	Maint bldg	Sep 63	--	
35	Maint bldg	Sep 63	--	
36	Maint bldg	Sep 63	--	
37	Maint bldg	Sep 63	--	
38	Tank	Jun 64	--	Semiburied and earth mounded with 2 vents protruding through earth; may contain propellants/blast deflector coolant
39	U/I structure	Sep 63	Jun 64	Dimensions overall
40	Tank	Jun 64	--	Similar to item 38 except has 6 vents protruding through earth
41	Checkout/support bldg	Jun 62	--	
42	Test support bldg	Jun 64	--	
43	Service bldg	Jul 66	--	
44	Tank	Jul 65	Sep 67	Semiburied tank with at least 2 vents; associated with items 45 and 46
45	Poss altitude simulation test bldg	Feb 64	Jul 66	
46	Poss altitude simulation test bldg	Feb 64	Jul 66	Associated with a small exhaust stack
47	Cooling pond/dump pit	Jun 64	Jul 66	Associated with poss altitude simulation facility; sq ft measurement represents surface area
48	Service bldg	Sep 63	--	
49	Service bldg	Sep 63	--	Appears to be an shed poss served by small crane way
50	Service bldg	Sep 63	--	Items 50-52 prob associated with propellant and equipment storage
51	Service bldg	Sep 63	--	
52	Service bldg	Sep 63	--	
53	Service bldg	Sep 63		
54	Storage bldg	Jun 62	--	Appears to be an open shed located adjacent to road-served parking apron
55	Service bldg	Sep 63		
56	Service bldg	Sep 63	Jul 66	Length and width dimensions overall; additional support building measures [redacted] with roof cover of 609 sq ft
57	Maint bldg	Sep 63	Jul 66	
58	Storage bldg	Jun 62	--	Similar to item 54

*Dimensions are accurate to within ±5% or 5 ft, whichever is greater.
**Complete when first observed unless noted.

[redacted] 25X1

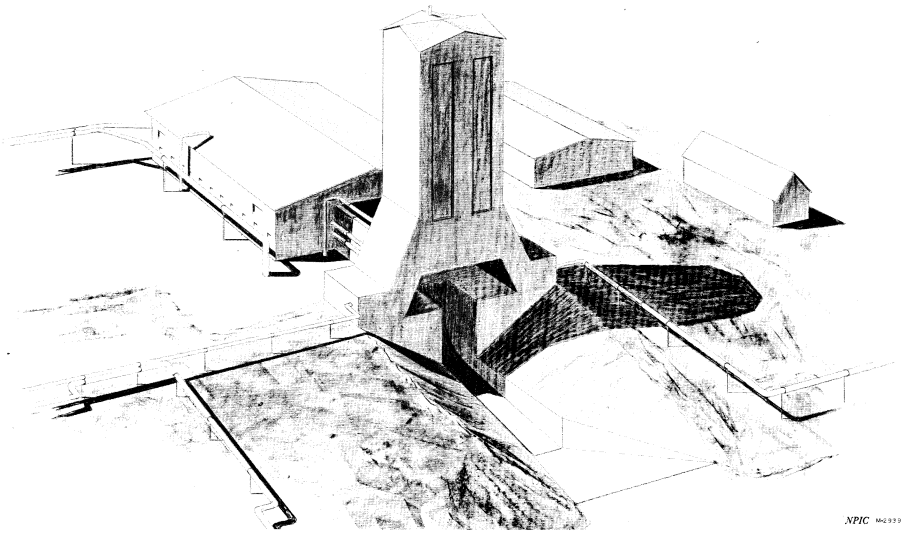

FIGURE 6. ARTIST'S CONCEPTION OF TEST STAND 1.

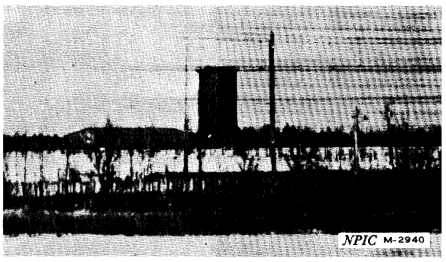

FIGURE 7. GROUND PHOTOGRAPHY OF TEST STAND 1, MARCH 1966.

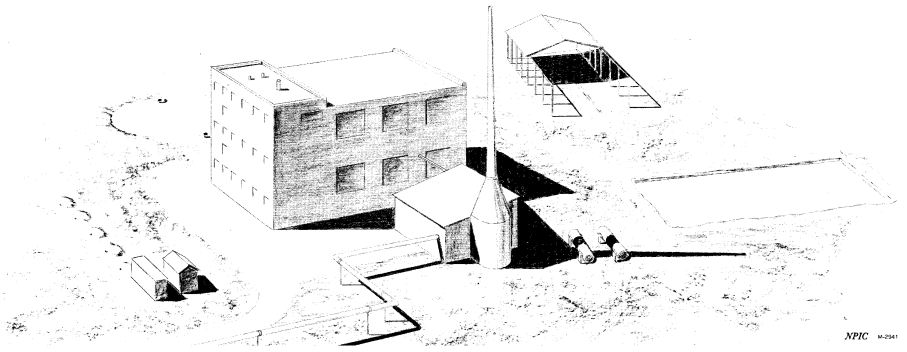

FIGURE 8. ARTIST'S CONCEPTION OF POSSIBLE SMALL ROCKET ENGINE ALTITUDE SIMULATION TEST FACILITY.

FIGURE 9. PLANT AREA OF PLANT 301, SEPTEMBER 1967.

[redacted] 25X1

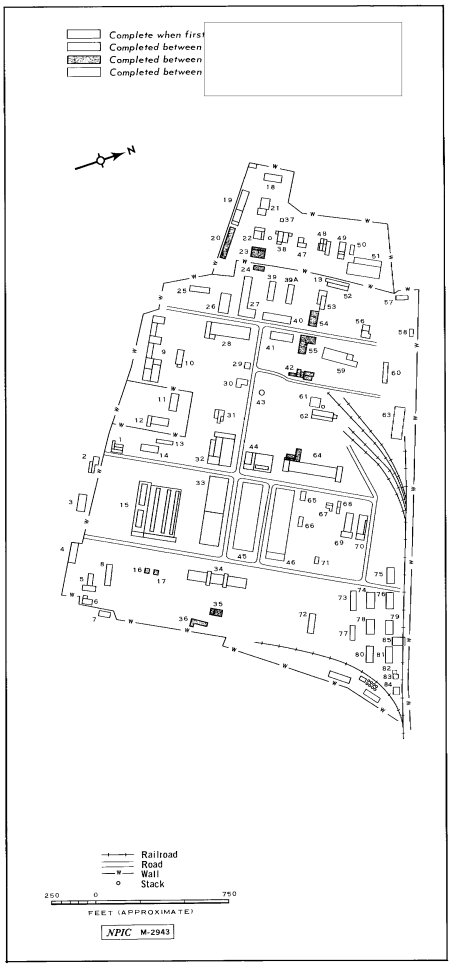

FIGURE 10. LAYOUT OF PLANT AREA.

Table 2. Plant Area of Plant 301
(Item numbers are keyed to Figure 10)

Item No	Function/ Description	Date First Observed**	Date Observed Complete	Explanatory Notes
1	Storage bldg	Nov 62	--	
2	Support bldg	Nov 62	--	Located outside main security fence
3	Support bldg	Nov 62	--	Located outside main security fence
4	Lab/engineering bldg	Nov 62	--	
5	Support bldg	Nov 62	--	
6	Support bldg	Nov 62	--	Width overall
7	Support bldg	Nov 62	--	Located outside main security fence
8	Storage bldg	Nov 62	--	
9	Lab/engineering bldg	Sep 44	--	Width overall, height to highest bay
10	Storage bldg	Sep 44	--	
11	Security bldg/bks	Nov 62	--	
12	Security bldg/bks	Nov 62	--	
13	Support bldg	Nov 62	--	
14	Storage bldg	Nov 62	--	
15	Main assembly bldg	Sep 44	Nov 62	High bay section complete when first observed Nov 62; length overall
16	Water reservoir	Sep 63	Jun 64	Surrounded by [redacted] high prob concrete wall
17	Water reservoir	Sep 63	Jun 64	Surrounded by [redacted] high prob concrete wall
18	Storage bldg	Nov 62	--	
19	Storage bldg	Sep 44	Nov 62	Dimensions overall
20	Storage bldg	Sep 63	Jun 64	
21	Storage bldg	Nov 62	--	
22	Poss heat treatment bldg	Nov 62	--	Height overall
23	Support bldg	Jun 64	--	
24	Support bldg	Jun 64	--	
25	Motor pool	Nov 62	--	Associated with large vehicle parking area
26	Motor pool	Nov 62	--	
27	Shop bldg	Nov 62	--	Width overall
28	Shop bldg	Nov 62	--	Width overall
29	Support bldg	Oct 64	Jan 65	
30	Support bldg	Oct 64	Jan 65	
31	Support bldg	Oct 64	Jan 65	
32	Shop bldg	Sep 44	--	Length and width overall
33	Assembly/fabrication bldg	Sep 44	--	Rebuilt since 1944
34	Admin/engineering bldg	Nov 62	--	Dimensions overall
35	Support bldg	Jun 64	--	
36	Storage bldg	Jun 64	--	
37	Support bldg	Nov 62	--	
38	Poss heat treatment bldg	Sep 44	--	
39	Storage bldg	Nov 62	--	Similar to item 39A
39A	Storage bldg	Nov 62	--	
40	Storage bldg	Nov 62	--	
41	Support bldg	Nov 62	--	
42	Admin bldg	Jun 64	--	
43	Water tower	Sep 44	--	Height aprx
44	Shop bldg	Sep 44	--	May not be in use
45	Assembly/fabrication bldg	Sep 44	Oct 64	Rebuilt since 1944
46	Assembly/fabrication bldg	Sep 44	Jun 64	Rebuilt between May 66 and Jun 67; transverse monitors removed
47	Support bldg	Sep 44	--	Length overall
48	Support bldg	Sep 44	--	
49	Storage bldg	Sep 44	--	
50	Support bldg	Jul 66	--	
51	Maintenance bldg	Jul 66	Sep 67	Contains numerous roof ventilators
52	Storage bldg	Nov 62	--	Remains under construction
53	Storage/support bldg	Nov 62	--	Prob associated with item 54
54	Support bldg	Jun 64	--	
55	Admin bldg	Jun 64	--	May be used as a messhall; dimensions overall
56	Support bldg	Nov 62	--	
57	Construction/support bldg	Nov 62	--	In an area of continuing construction activity
58	Construction/support bldg	Nov 62	--	In an area of continuing construction activity
59	Shop bldg	Oct 64	--	Width & length dimensions overall
60	Support bldg	Nov 62	--	
61	Steamplant	Oct 64	--	Items 61 and 62 located adjacent
62	Steamplant	Sep 44	--	to large coal pile; apparently uses oil as back up fuel
63	Receiving/shipping bldg	Nov 62	--	Remains in early stage of construction
64	Shop bldg	Sep 44	Jun 64	Overall dimensions do not include sheds at NW corner of bldg; SW portion of bldg complete Jun 64
65	Support bldg	Oct 64	--	
66	Support bldg	Oct 64	--	
67	Support bldg	Oct 64	--	Length & width overall
68	Maint bldg	Oct 64	--	
69	Shop bldg	Nov 62	--	Dimensions overall
70	Shop bldg	Nov 62	--	
71	Support bldg	Nov 62	--	
72	Storage bldg	Nov 62	--	
73	Storage bldg	Nov 62	--	
74	Storage bldg	Sep 44	--	
75	Storage bldg	Sep 44	--	Apparently used for materials
76	Storage bldg	Sep 44	--	storage; all structures located
77	Storage bldg	Nov 62	--	close to the main rail spur and
78	Storage bldg	Sep 44	--	prob served by main transloading
79	Storage bldg	Sep 44	--	building, item 85
80	Storage bldg	Sep 44	--	
81	Storage bldg	Sep 44	--	
82	Shipping/receiving bldg	Oct 64	Jul 66	
83	Shipping/receiving bldg	Oct 64	Jul 66	
84	Depot	Oct 64	Jul 66	Prob controls shipping/receiving activity
85	Transloading bldg	Oct 64	Jul 66	Rail spur runs through this structure; dimensions aprx due to poor interpretability

*Dimensions are accurate to within ±5% or 5 ft whichever is greater.
**Complete when first observed unless noted.

The most significant change was additional roof cover added to the checkout/assembly building (item 10) which was increased by 12,250 square feet. This building is similar in size to the main assembly checkout building supporting Test Stand 1 at the Omsk Rocket Engine Test Facility and is also comparable in size with the assembly/checkout buildings at the Kurumoch, Krasnoyarsk, Perm and Voronezh Rocket Engine Test Facilities. 4/ Since Plant 301 produced and tested engines for the V-301 surface-to-air missile, it follows that its main assembly/checkout building would be similar to those found at other facilities primarily engaged in missile production and acceptance test programs.

No signs of recent test activity were observed at Test Stand 1 during this time period.

1965 - September 1967

The most significant construction during this period was the completion of a possible small rocket engine altitude simulation test facility (items 45 and 46, Figure 5) and its associated cooling pond/dump pit (item 47). In addition, 2 pipelines were constructed connecting Test Stand 1 to a large semiburied tank (item 44) located adjacent to the possible altitude simulation test facility. Roof cover during this time was increased by 25,662 square feet to a present total of 133,184 square feet. No signs of recent test activity were observed at Test Stand 1.

DESCRIPTIONS OF SELECTED STRUCTURES

Although Table 1 provides an interpretation of the function of each significant structure at the test facility, the following items are of sufficient importance to warrant a more detailed discussion.

Test Stand 1

Although Test Stand 1, shown as an artist's conception in Figure 6, was reportedly complete by 1956, its operational status was undetermined. 1/ It appeared in 1956 to be similar to Test Stand 1 at Khimki Plant 456, but this cannot be substantiated on existing photography which shows them to be somewhat dissimilar at present. The stand appeared complete when first observed on ground photography in April 1960 (Figure 7). No apparent changes have taken place since that time. The superstructure is [redacted] and 85 feet high. It rises from a rectangular base that is approximately 70 [redacted] at ground level. The blast pit is a minimum of 13 feet wide under the superstructure and expands to a maximum of 40 feet. The paved portion of the blast deflector extends [redacted] from the superstructure. Large-diameter pipelines were constructed from the stand to a large semiburied tank (item 44). The function of this system is not clear at this time; the system could be used for propellant disposal or possibly as a water supply for blast deflector cooling. In any event, it is apparently a modification of the original stand used to test the V-301 engine.

Possible Small Rocket Engine Altitude Simulation Test Facility

Located at the northeast edge of the Test Area is a unique facility. It consists of 2 buildings (items 45 and 46) with a stack adjacent to the second building (item 46). A large cooling pond/dump pit is associated with both items. A set of vented earth-mounded tanks are collocated with these structures. Although this facility is not analogous to other known test facilities in the Soviet Union, it does appear physically similar to an altitude simulation stand located at the NASA engine acceptance test facilities, Leuhman Ridge, Edwards Air Force Base, California. This stand is rated at 25,000 pounds of thrust. It is interesting to note that a large catch tank is connected to the Edwards stand by a large-diameter pipeline similar to the situation in existence at Khimki Plant 301 Test Area. A facility of this type may be used for testing small, upper-stage engines in an altitude simulation environment (simulating the degree of vacuum encountered in the upper atmosphere and outer space). An artist's conception of the facility is presented in Figure 8.

PLANT 301 PLANT AREA

The Plant Area of the Moskva Guided Missile Research and Development Plant 301 (Figure 9) was present on photography of September 1944 (see Figure 3).

Considerable additional expansion took place during the 1950's with several large assembly/fabrication buildings being rebuilt and added to. Numerous support, shop, and material storage buildings have been completed since 1961 when the plant was first observed on KEYHOLE photography. Table 2, keyed to a layout drawing of the Plant Area shown in Figure 10, summarizes the available data from 25 photographic missions that have covered the facility in the time period beginning in July 1961 and ending in September 1967. A critical appraisal of all photography covering the center has resulted in interpretations of functions of most structures; mensural data of all key buildings as well as their chronological development is included.

Since very little construction has taken place during the past 3 years, it may be assumed that the Plant Area of Khimki Plant 301 is close to completion. At present it includes [redacted]

The following table shows the rate of expansion in the Plant Area as indicated by the square footage of roof cover added during successive periods since September 1944. Square footage of roof cover for each time period includes roof cover of structures razed and, in some cases, replaced.

Date	[redacted]
Present, September 1944	
Added, September 1944 - November 1962	
Added, November 1962 - June 1964	
Added, June 1964 - September 1967	

The Plant Area is road and rail served and is secured by a single fence system. The area contains its own heating plant (items 61 and 62, Figure 10) and probably receives its electrical power through the large electric substation serving Khimki Plant 293. The large main assembly building (item 15) and its numerous support, shop, and subassembly buildings give this plant ample space to produce liquid propellant rocket engines as well as associated tankage.

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3. CIA. ATIC Vol VII No 22, Card No C09151, Firm No 7012182, 30 May 58 (SECRET)
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REQUIREMENT

CIA. C-DI5-82,973

NPIC PROJECT

11212EC/66